

WHAT IS CLAIMED IS:

- 1           1.       A method for reducing a condition associated with fetal alcohol  
2       syndrome in a subject who is exposed to alcohol *in utero*, the method comprising  
3       administering to the subject an ADNF polypeptide in an amount sufficient to reduce the  
4       condition associated with fetal alcohol syndrome.
  
- 1           2.       The method of claim 1, wherein the ADNF polypeptide is a  
2       member selected from the group consisting of:
  - 3           (a) an ADNF I polypeptide comprising an active core site having the  
4       following amino acid sequence:

5                   Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1);

  - 6           (b) an ADNF III polypeptide comprising an active core site having the  
7       following amino acid sequence:

8                   Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2); and

  - 9           (c) a mixture of the ADNF I polypeptide of part (a) and the ADNF III  
10          polypeptide of part (b).
  
- 1           3.       The method of claim 1, wherein the ADNF polypeptide is a  
2       member selected from the group consisting of a full length ADNF I polypeptide, a full  
3       length ADNF III polypeptide, and a mixture of a full length ADNF I polypeptide and a  
4       full length ADNF III polypeptide.
  
- 1           4.       The method of claim 1, wherein the ADNF polypeptide is an  
2       ADNF I polypeptide.
  
- 1           5.       The method of claim 4, wherein the ADNF I polypeptide is Ser-  
2       Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1).
  
- 1           6.       The method of claim 4, wherein the ADNF I polypeptide is  
2       selected from the group consisting of:
  - 3           Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);
  - 4           Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5       Ala (SEQ ID NO:15);
  - 6           Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7           Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8           Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18); and  
9           Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19).

1           7.       The method of claim 4, wherein the ADNF I polypeptide  
2           comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3           of the active core site.

1           8.       The method of claim 1, wherein the ADNF polypeptide is an  
2           ADNF III polypeptide.

1           9.       The method of claim 8, wherein the ADNF III polypeptide is Asn-  
2           Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           10.      The method of claim 8, wherein the ADNF III polypeptide is  
2           selected from the group consisting of:

3            Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
4            Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
5            Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
6            NO:22); and  
7            Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
8           (SEQ ID NO:23).

1           11.      The method of claim 8, wherein the ADNF III polypeptide  
2           comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3           of the active core site.

1           12.      The method of claim 1, wherein the ADNF polypeptide is a  
2           mixture of an ADNF I polypeptide of part (a) and an ADNF III polypeptide of part (b).

1           13.      The method of claim 12, wherein the ADNF I polypeptide is Ser-  
2           Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3           polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           14.      The method of claim 12, wherein the ADNF I polypeptide is  
2           selected from the group consisting of:  
3            Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);  
6 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);  
9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:  
12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);  
13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16 NO:22); and  
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18 (SEQ ID NO:23).

1 15. The method of claim 12, wherein the ADNF I polypeptide  
2 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3 of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4 comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5 of the active core site of the ADNF III polypeptide.

1 16. The method of claim 1, wherein at least one of the ADNF  
2 polypeptide is encoded by a nucleic acid which is administered to the subject.

1 17. The method of claim 1, wherein the condition is decreased body  
2 weight of the subject.

1 18. The method of claim 1, wherein the condition is decreased brain  
2 weight of the subject.

1 19. The method of claim 1, wherein the condition is a decreased level  
2 of VIP mRNA or protein of the subject.

1 20. The method of claim 1, wherein the condition is decreased viability  
2 of the subject *in utero*.

1           21.     The method of claim 1, wherein the condition is decreased  
2 learning.

1           22.     A method for reducing neuronal cell death, the method comprising  
2 contacting a neuronal cell with a mixture of an ADNF I polypeptide and an ADNF III  
3 polypeptide in an amount sufficient to reduce neuronal cell death,

4                 wherein the ADNF I polypeptide comprises an active core site having the  
5 following amino acid sequence:

6                 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and

7                 wherein the ADNF III polypeptide comprises an active core site having the  
8 following amino acid sequence:

9                 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           23.     The method of claim 22, wherein the ADNF I polypeptide is a full  
2 length ADNF I polypeptide and the ADNF III polypeptide is a full length ADNF III  
3 polypeptide.

1           24.     The method of claim 22, wherein the ADNF I polypeptide is Ser-  
2 Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the ADNF III  
3 polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           25.     The method of claim 22, wherein the ADNF I polypeptide is  
2 selected from the group consisting of:

3                 Val-Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);

4                 Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5 Ala (SEQ ID NO:15);

6                 Leu-Gly-Gly-Gly- Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);

7                 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);

8                 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18);

9                 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and

10                 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:

12                 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2);

13                 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);

14                 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);

15           Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16           NO:22); and  
17           Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18           (SEQ ID NO:23).

1           26.       The method of claim 22, wherein the ADNF I polypeptide  
2           comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
3           of the active core site of the ADNF I polypeptide, and wherein the ADNF III polypeptide  
4           comprises up to about 20 amino acids at at least one of the N-terminus and the C-terminus  
5           of the active core site of the ADNF III polypeptide.

1           27.       The method of claim 22, wherein at least one of the ADNF  
2           polypeptide is encoded by a nucleic acid.

1           28.       A pharmaceutical composition comprising a pharmaceutically  
2           acceptable excipient and a mixture of an ADNF I polypeptide and an ADNF III  
3           polypeptide, wherein the ADNF I polypeptide comprises an active core site having the  
4           following amino acid sequence:

5           Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and  
6           wherein the ADNF III polypeptide comprises an active core site having the following  
7           amino acid sequence:

8           Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           29.       The pharmaceutical composition of claim 28, wherein the ADNF I  
2           polypeptide is a full length ADNF I polypeptide and the ADNF III polypeptide is a full  
3           length ADNF III polypeptide.

1           30.       The pharmaceutical composition of claim 28, wherein the ADNF I  
2           polypeptide is Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1), and wherein the  
3           ADNF III polypeptide is Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2).

1           31.       The pharmaceutical composition of claim 28, wherein the ADNF I  
2           polypeptide is selected from the group consisting of:

3           Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:14);  
4           Val-Glu-Glu-Gly-Ile-Val-Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-  
5           Ala (SEQ ID NO:15);

6 Leu-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:16);  
7 Gly-Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:17);  
8 Gly-Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:18)  
9 Gly-Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:19); and  
10 Ser-Ala-Leu-Leu-Arg-Ser-Ile-Pro-Ala (SEQ ID NO:1); and wherein the ADNF III  
11 polypeptide is selected from the group consisting of:  
12 Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:2)  
13 Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln (SEQ ID NO:20);  
14 Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID NO:21);  
15 Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser (SEQ ID  
16 NO:22); and  
17 Ser-Val-Arg-Leu-Gly-Leu-Gly-Gly-Asn-Ala-Pro-Val-Ser-Ile-Pro-Gln-Gln-Ser  
18 (SEQ ID NO:23).

1           32. The pharmaceutical composition of claim 28, wherein the ADNF I  
2 polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
3 the C-terminus of the active core site of the ADNF I polypeptide, and wherein the ADNF  
4 III polypeptide comprises up to about 20 amino acids at at least one of the N-terminus and  
5 the C-terminus of the active core site of the ADNF III polypeptide.

1           33. The pharmaceutical composition of claim 28, wherein at least one  
2 of the ADNF polypeptide is encoded by a nucleic acid.